

Total No. of Questions : 12]

SEAT No. :

P2397

[Total No. of Pages : 2

[5253] - 108

T.E. (Civil) (Semester - II)

FOUNDATION ENGINEERING

(2012 Pattern)

Time : 2.30 Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10 and Q.11 or Q.12.
- 2) Neat diagrams must be drawn whenever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary and mention it clearly.

**SECTION - I**

Q1) Explain electrical resistivity method with respect to [6]

- a) Principle
- b) Procedure
- c) Sketch
- d) Limitations

OR

Q2) Discuss how you will determine the depth and number of boreholes for important projects. [6]

Q3) Explain plate load test with respect to [7]

- a) Procedure
- b) Sketch
- c) Limitations

OR

Q4) Using Terzaghi's theory, compute the safe bearing capacity of a footing of size 5m × 3m located at a depth of 1.5m below the ground level in a loose sand of average density of 16 kN/m<sup>3</sup>. Take  $\phi = 35^\circ$ ,  $N_c = 46.13$ ,  $N_q = 33.3$ ,  $N_\gamma = 40.71$ . Assume factor of safety = 3 and water table very deep. [7]

Q5) a) Define contact pressure. Draw a diagram showing the variation of contact pressure for a rigid footing on clay and sand. [3]

- b) Explain with a neat sketch spring analogy for demonstrating consolidation process. [4]

OR

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**Q6)** In a consolidation test, the void ratio of the specimen, which was 1.068 under the effective stress of 214 KN/m<sup>2</sup>, changed to 0.994 when the pressure was increased to 429 KN/m<sup>2</sup>. Calculate the coefficient of compressibility, compression index and coefficient of volume compressibility. [7]

**SECTION - II**

- Q7)** a) Explain 'cyclic pile load' test. [6]  
b) What is the effect of negative skin friction on pile? How it can be reduced? [5]  
c) Enlist the types of piles according to function. [5]

OR

- Q8)** a) What is caisson? Enlist its uses. [4]  
b) Enlist the advantages and disadvantages of drilled piers. [6]  
c) A circular pile section with 0.35 m diameter and length of 10 m penetrates into a clay having  $c = 50 \text{ kN/m}^2$  and mobilization factor = 0.8. Calculate the safe load with factor of safety = 2.5. Neglect the bearing resistance. [6]

- Q9)** a) Explain the terms with sketches [6]  
i) free earth support and  
ii) fixed earth support in sheet piles.  
b) What is anchored sheet pile? Enlist and draw any four types of anchors. [5]  
c) Discuss any three types of cofferdams. [6]

OR

- Q10)** a) Explain any three engineering problems associated with black cotton soil. [6]  
b) Write a note on 'stone column'. [6]  
c) Draw a neat sketch of 'under reamed pile' and name all the parts. [5]

- Q11)** a) Explain with a neat sketch, the mechanism of reinforced soil. [6]  
b) Explain any three types of geosynthetics. [6]  
c) Explain the use of geosynthetics in bearing capacity improvement. [5]

OR

- Q12)** a) What do you mean by 'Liquefaction'? What are its effects on built environment? [6]  
b) Explain different types of seismic waves. [6]  
c) Explain how possibility of Liquefaction can be reduced? [5]

